August 2016

This Month...

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**Publication**

Remarkable progress, new horizons and renewed commitment

Ending preventable maternal, newborn and child deaths in South-East Asia Region

Dr Poonam Khetrapal Singh, Regional Director of WHO South-East Asia Region, released the publication “Remarkable, progress, new horizons and renewed commitment - ending preventable maternal, newborn and child deaths in the region” during the Sixty-ninth Session of the Regional Committee of the WHO South-East Asia Region. At the threshold of Sustainable Development Goals (SDG) era, this document captures the remarkable achievements by Member States towards achieving MDGs 4 and 5. It acknowledges new opportunities in the post-2015 phase shaped by the SDGs and the Global Strategy for women’s, children’s and adolescents’ health and presents an advanced state of preparedness in the Region. This also highlights the region’s renewed commitment for a more inclusive and more dynamic flagship action for ending preventable maternal, newborn and child mortality as well as to improve women’s, children’s and adolescents’ health and wellbeing in the South-East Asia Region.

**Birth Defects**

**Association between Zika virus infection and microcephaly in Brazil, January to May, 2016: preliminary report of a case-control study**


Dr Thalia Velho Barreto de Araújo, PhD, Prof Laura Cunha Rodrigues, PhD, Prof Ricardo Arraes de Alencar Ximenes, PhD, Demócrito de Barros Miranda-Filho, PhD, Ulisses Ramos Montarroyos, PhD, Ana Paula Lopes de Melo, MSc, Sandra Valongueiro, PhD, Maria
Abstract

BACKGROUND

The microcephaly epidemic, which started in Brazil in 2015, was declared a Public Health Emergency of International Concern by WHO in 2016. We report the preliminary results of a case-control study investigating the association between microcephaly and Zika virus infection during pregnancy.

METHODS

We did this case-control study in eight public hospitals in Recife, Brazil. Cases were neonates with microcephaly. Two controls (neonates without microcephaly), matched by expected date of delivery and area of residence, were selected for each case. Serum samples of cases and controls and cerebrospinal fluid samples of cases were tested for Zika virus-specific IgM and by quantitative RT-PCR. Laboratory-confirmed Zika virus infection during pregnancy was defined as detection of Zika virus-specific IgM or a positive RT-PCR result in neonates. Maternal serum samples were tested by plaque reduction neutralisation assay for Zika virus and dengue virus. We estimated crude odds ratios (ORs) and 95% CIs using a median unbiased estimator for binary data in an unconditional logistic regression model. We estimated ORs separately for cases with and without radiological evidence of brain abnormalities.

FINDINGS

Between Jan 15, 2016, and May 2, 2016, we prospectively recruited 32 cases and 62 controls. 24 (80%) of 30 mothers of cases had Zika virus infection compared with 39 (64%) of 61 mothers of controls (p=0·12). 13 (41%) of 32 cases and none of 62 controls had laboratory-confirmed Zika virus infection; crude overall OR 55·5 (95% CI 8·6-8); OR 113·3 (95% CI 14·5-8) for seven cases with brain abnormalities; and OR 24·7 (95% CI 2·9-8) for four cases without brain abnormalities.

INTERPRETATION

Our data suggest that the microcephaly epidemic is a result of congenital Zika virus infection. We await further data from this ongoing study to assess other potential risk factors and to confirm the strength of association in a larger sample size.

Maternal exposure to radiographic exams and major structural birth defects


Abstract

BACKGROUND

An increasing number of radiologic exams are performed in the United States, but very few studies have examined the effects of maternal exposure to radiologic exams during the periconceptional period and birth defects.

OBJECTIVES

To assess the association between maternal exposure to radiologic exams during the periconceptional period and 19 categories of birth defects using a large population-based study of birth defects.

METHODS

We studied 27,809 case mothers and 10,200 control mothers who participated in the National Birth Defects Prevention Study and delivered between 1997 and 2009. Maternal exposure to radiologic exams that delivered ionizing radiation to the urinary tract, lumbar spine, abdomen, or pelvis were identified based on the mother's report of type of radiologic exams, organ or body part scanned and the month during which the exam occurred.

RESULTS

Overall, 0.9% of mothers reported exposure to one of these types of radiographic exams during the periconceptional period. We observed significant associations between maternal exposure during the first trimester and isolated Dandy-Walker malformation (odds ratio = 7.7; 95% confidence interval, 1.8-33) and isolated d-transposition of the great arteries (odds ratio = 3.8; 95% confidence interval,
1.4-10.3). However, the result for isolated Dandy-Walker malformation was based on only two exposed cases.

**CONCLUSIONS**
These results should be interpreted cautiously because multiple statistical tests were conducted and measurements of exposure were based on maternal report. However, our results may be useful for generating hypotheses for future studies.

**Newborn**

**Decreasing infection in neonatal intensive care units through quality improvement**

Published Online First 2 May 2016

J R Bowen, I Callander, R Richards, K B Lindrea for the Sepsis Prevention in NICUs.

**Abstract**

**OBJECTIVE**
To decrease the incidence of bloodstream infection (BSI) for neonates <29 weeks gestation through quality improvement.

**DESIGN**
Commencing in September 2011, eight neonatal intensive care units (NICUs) in New South Wales and Australian Capital Territory, Australia participated in the Sepsis Prevention in NICUs Group project, a multicentre quality improvement initiative to reduce neonatal infection through implementation of potentially better practices and development of teaching resources. Data were collected for neonates <29 weeks gestation from D3 to 35, using point of care data entry, for BSI, central line-associated BSI (CLABSI) and antibiotic use. Exponentially weighted moving average data trend lines for rates of BSI, CLABSI and antibiotic use for each NICU were automatically generated and composite charts were provided each month to participating NICUs.

**RESULT**
Between January 2012 and December 2014, data were collected from D3 to 35 for 1075 neonates <29 weeks gestation who survived >48 h, for a total of 33 933 bed days and 14 447 central line days. There was a significant decrease from 2012 to 2014 in BSI/1000 bed days (7.8±3.0 vs 3.8±1.1, p=0.000), CLABSI/1000 bed days (4.6±2.1 vs 2.1±0.8, p=0.003), CLABSI/1000 central line days (9.9±4.3 vs 5.4±1.7, p=0.012) and antibiotic days/100 bed days (31.1±4.3 vs 25.5±4.2, p=0.046)

**CONCLUSIONS**
This study demonstrates a >50% reduction in BSI in extremely premature neonates from D3 to 35 following a collaborative quality improvement project to reduce neonatal infection across an NICU network, supported by timely provision of data.

**Characterisation and antimicrobial resistance of sepsis pathogens in neonates born in tertiary care centres in Delhi, India: a cohort study**

Investigators of the Delhi Neonatal Infection Study (DeNIS) collaboration

**Abstract**

**BACKGROUND**
Sepsis is one of the most common causes of neonatal deaths globally. Most sepsis-related deaths occur in low-income and middle-income countries, where the epidemiology of neonatal sepsis remains poorly understood. Most of these countries lack proper surveillance networks, hampering accurate assessment of the burden of sepsis, implementation of preventive measures, and investment in research. We report results of neonates born in hospital from a multicentre collaboration on neonatal sepsis.

**METHODS**
In this cohort study, dedicated research teams prospectively followed up neonates born in one of three tertiary care centres in Delhi, India (Vardhaman Mahavir Medical College, Maulana Azad Medical College, and All India Institute of Medical Sciences [coordinating centre]) and subsequently admitted to the intensive care unit. Neonates were followed up daily until discharge or death. On clinical suspicion, neonates underwent sepsis work-up including blood cultures. The isolated organisms were identified...
and tested for antimicrobial susceptibility. We defined Gram-negative isolates resistant to any three of five antibiotic classes (extended-spectrum cephalosporins, carbapenems, aminoglycosides, fluoroquinolones, and piperacillin-tazobactam) as multidrug resistant.

**FINDINGS**

13 530 neonates of 88 636 livebirths were enrolled between July 18, 2011, and Feb 28, 2014. The incidence of total sepsis was 14·3% (95% CI 13·8-14·9) and of culture-positive sepsis was 6·2% (5·8-6·6). Nearly two-thirds of total episodes occurred at or before 72 h of life (defined as early onset; 1351 [83%] of 1980). Two-thirds (645 [64%]) of 1005 isolates were Gram-negative including, Acinetobacter spp (22%), Klebsiella spp (17%), and Escherichia coli (14%). The pathogen mix in early-onset sepsis did not differ from that of late-onset sepsis (ie, after 72 h). High rates of multidrug resistance were observed in Acinetobacter spp (181/222, 82%), Klebsiella spp (91/169, 54%), and Escherichia coli (52/137, 38%) isolates. Meticillin resistance prevailed in 61% (85/140) of coagulase-negative staphylococci and 38% (43/114) of Staphylococcus aureus isolates. Nearly a quarter of the deaths were attributable to sepsis. The population-attributable risks of mortality were 8·6% in culture-negative sepsis, 15·7% in culture-positive sepsis by multidrug-resistant organisms, and 12·0% in culture-positive sepsis by non-multidrug-resistant organisms.

**INTERPRETATION**

The high incidence of sepsis and alarming degree of antimicrobial resistance among pathogens in neonates born in tertiary hospitals underscore the need to understand the pathogenesis of early-onset sepsis and to devise measures to prevent it in low-income and middle-income countries.